

6. *Oliva pulchra*, Marrat.

Shell fusiform, rather narrow; spire conical, whorls slightly flattened; suture canaliculate; pale cream-coloured, with brown festoons below the suture; body-whorl with irregular brown longitudinal flames, spotted above the white basal band; columella slightly granular, with a single fold at the base.

Among some shells from California; but the locality is doubtful. A small shell, not larger than *O. oryza*, Lam.

XXIII.—On a new Genus of *Gastrotrichous Rotatoria*.

By E. CLAPARÈDE*.

THE genera *Chaetonotus*, Ehrb., and *Ichthydium*, Ehrb., have hitherto occupied only an uncertain place in the zoological system. M. Ehrenberg joined them to *Ptygura* and *Glenophora* to form a family of Rotatoria; Dujardin considered them to belong to the Infusoria; M. Vogt classes them in a general way among the Vermes; M. Schmarda makes them almost Annelides; M. Ehlers even approximates them to the Nematoida. The opinion most generally accredited is that which regards them as Turbellaria. M. Max Schultze was the first to develop this opinion when he made known, under the name of *Turbanella*†, a new genus belonging to the same group. The two authors who have most carefully studied these interesting animals of late are Mr. Gosse‡ and M. Mecz-
nikow§.

The former, in making known several new species, avoids pronouncing an opinion on the natural position to be assigned to the family Chaetonotides (Hairy-backed animalcules, as he calls them). It was, indeed, very difficult for him to form a judgment, on account of the unfortunate union with this family of two dissimilar genera, namely, *Taphrocampa*, Gosse, and *Echinoderes*, Duj. Now the *Taphrocampæ* are, as I have already demonstrated, true Rotatoria. As to *Echinoderes*, it has no affinities with either the Rotatoria or the Turbellaria. The mistake of Mr. Gosse with regard to them is easily ex-

* Translated from the 'Annales des Sciences Naturelles,' 5^e sér. tome viii. pp. 16–23.

† Beiträge zur Naturgeschichte der Turbellarien, von Dr. Max Sigismund Schultze, (Greifswald) p. 69.

‡ "The Natural History of the Hairy-backed Animalcules" (Intellectual Observer, 1864, pp. 307–406).

§ "Ueber *Chaetonotus* und *Ichthydium*, und eine neue verwandte Gattung *Turbanella*," Müller's Archiv, 1853, p. 241.

plained, as that naturalist only knew *Echinoderes* from a bad figure of Dujardin's. After the recent investigations on this singular type, Mr. Gosse would no longer think of approximating it to *Chaetonotus*.

M. Mecznirow* not only describes several species hitherto unknown, but also makes known, under the names of *Chaetura* and *Cephalidium*, two very remarkable new genera evidently nearly allied to the preceding. This naturalist reviews all the previously expressed opinions as to the zoological position of this singular group; he discusses them carefully, and ends by rejecting them. He himself resolved to erect the genera that we have enumerated into an order apart, under the name of *Gastrotricha*, an order which would form with that of the *Rotatoria* a peculiar class in the subdivision of *Vermes*. Finally, therefore, the *Ichthydinia* (for that is the name which has been most generally given to them), after having been tossed about in every direction on the ocean of classification, return to drop anchor nearly at their starting-point.

The opinion maintained by M. Mecznirow† has a good deal in its favour. In any case, I accept his order of *Gastrotricha*, characterized essentially by the clothing of vibratile cilia on the ventral surface of the body, and also by some other secondary characters, such as the absence of jaws &c. The affinity of this order with the *Rotatoria* also appears to me to be incontestable. The convenience of uniting all these animals in one class will then be the only subject of discussion. We know, moreover, that naturalists are still divided in opinion on the subject of the natural position to be assigned to the *Rotatoria*.

Putting on one side the latter question, we find the order of the *Gastrotricha* composed at present of six genera, namely, *Chaetonotus* (Ehrb.), *Ichthydium* (Ehrb.), *Chaetura* (Meczn.), *Cephalidium* (Meczn.), *Dasydites* (Gosse), *Turbanella* (Schlz.)‡.

* "Ueber einige wenig bekannte niedere Thierformen, von Elias Mecznirow," Zeitschr. f. wiss. Zoologie, 1865, Bd. xv. p. 450.

† 'Beobachtungen über Anatomie und Entwicklungsgeschichte wirbelloser Thiere and er Küste von Normandie angestellt von Dr. E. Claparède,' Leipzig, 1863, p. 90, pl. 16. figs. 7-16; and "Bemerkungen über Echinoderes von Elias Mecznirow" (Zeitschr. f. wiss. Zoologie, 1865, Bd. xv. 4tes Heft, p. 458). In the work cited I described two species under the names of *Echinoderes Dujardinii* and *E. monocereus*. A year later, without knowing of my observations, Mr. Gosse renamed the former of these species; but as he likewise dedicated it to Dujardin, this does not cause any inconvenience in synonymy. Mr. Gosse writes it *Echinodera*, and not *Echinoderes*.

‡ It is just to say that M. Perty, without discussing the question with the same care as M. Mecznirow, nevertheless arrived at nearly the same

All these genera consist at present only of freshwater species. It is therefore interesting to make full acquaintance with a marine form, which certainly differs much from the types hitherto described, so that I have been obliged to form for it a new genus, which I will characterize further on under the name of *Hemidasys**.

Hemidasys agaso lives abundantly in the most muddy parts of the port of Naples; hence its specific name (*agaso*, groom). For a long time I regarded it as an epizoon. The surest means of procuring it is to examine carefully the specimens of *Nereilepas caudata* (*Spio caudatus*, Delle Chiaje). We soon meet with some individuals bearing one or two specimens of *Hemidasys*: these are fixed by their posterior extremity between the feet of the Annelide. Their body, which is very contractile, elongates and contracts alternately, the anterior extremity feeling rapidly about in all directions, to seek its nourishment among the setæ of the *Nereilepas*. Their movements resemble those of many of the Rotatoria. In attentively examining the mud, we find several free *Hemidasys*; their being parasites, therefore, is only occasional or accidental. I have, however, never met with *Hemidasys* on other Annelides in the mud except *Nereilepas*.

Hemidasys agaso attains a length of 0·3 to 0·5 millim., with an average breadth of 0·12 millim. Its form is that of a small band, or thick strap, with nearly parallel margins. In general it is more flattened than most of the other Gastrotricha. The surface of the body is formed by a delicate cuticle separated from the adjacent parenchyma by a stratum of liquid of a slight rose-colour. The colour of this liquid is probably due to a simple effect of contrast, like that of the vacuoles and the contractile vesicles in the Infusoria. The liquid stratum is traversed by a great number of little bands, which pass directly from the parenchyma to the cuticle. At the point where it is attached to the latter, each band dilates a

result. ('Zur Kenntniss kleinster Lebensformen nach Bau, Function, Systematik, &c., von Dr. Maximilien Perty,' Bern, 1852, p. 35.)

* M. Meczniow also mentions the genus *Sacculus*, Gosse. On the other hand, the Russian naturalist does not mention *Dasydites*, Gosse, the diagnosis of which nevertheless dates back to 1851 (Ann. & Mag. Nat. Hist. Sept. 1851). In any case the genus *Sacculus* has nothing to do here. It was, it is true, classed originally among the Holotricha, Ehrb.; but this not very natural order contains, besides some Gastrotricha, certain true Rotatoria. The *Sacculi* have a mastax with two hammers and an incus. Their males are destitute of digestive apparatus; in short, they are true Rotatoria in all points. M. Meczniow certainly did not know them when he enumerated them among the Gastrotricha. Mr. Gosse, moreover, in his recent work on this group makes no mention of them.

little, and appears to contain a small nucleus. These dilations appear at first like little spots of the cuticle, and the latter consequently appears, under a sufficient magnifying-power, to be punctate.

The dorsal surface of the body is even. On the other hand, its ventral surface has some small appendages, of a conical form, whose position and number are always the same: all show the same conformation; they are cones formed by a prolongation of the cuticle, and enclosing an axial cord, which can be easily traced to the parenchyma of the body. This cord is separated from its cuticular covering by a liquid or semiliquid stratum. We find first of all six of these conical appendages disposed in a half-ring a little behind the buccal extremity; the two outermost are the largest, and the two innermost the smallest; the two intermediate ones have a medium size.

The following appendages are distributed in pairs on the two sides of the body, but in such a manner that the first two-fifths of its length are destitute of them. Between the two hindermost appendages are placed eight others of smaller size, in a transverse line. Lastly, there are two more placed near the generative pore. In all the cones in the posterior part of the body the axis appears to me to be double.

All these appendages are moveable, and serve, no doubt, as tactile organs, perhaps also as levers facilitating locomotion. Those which form transverse ranges appear to be mutually dependent, and move together like a comb.

The cuticle also bears vibratile cilia, which appear to play the principal part in locomotion when the animal is free: these cilia are exclusively ventral; they form a band which extends from the foremost pair of conical appendages for almost two-fifths of the total length of the animal. At this point, which is exactly at the level of the union of the œsophagus and intestine, the ciliated band stops abruptly; behind there are no vibratile cilia. The *Hemidasys*, therefore, properly speaking, are *Thoracotricha* rather than properly *Gastrotricha*.

The anterior extremity is separated from the rest of the body by a slight constriction at the level of the anterior pair of ventral appendages. This part may be designated by the name of *cephalic lobe*, although, leaving the mouth out of consideration, it presents nothing which could characterize a head. This lobe is covered with slender and stiff bristles, like the tactile bristles of the Mollusca, Annelides, and Turbellaria, and in particular those of the other *Gastrotricha*. The mouth is terminal, surrounded by a circular lip broken up into little obtuse papillæ and covered with vibratile cilia. It leads

into a cavity which may be regarded as the buccal cavity, and from this into a straight muscular œsophagus, which extends through the first two-fifths of the body. This part of the digestive tube alone can enable us to understand the approximation that M. Ehlers has attempted to make between the *Gastrotricha* and the *Nematoida*. However, this analogy is of no importance. The cuticle of the œsophagus is a little thicker immediately behind the buccal cavity. The intestine is cylindrical and of a yellowish green colour, with its walls filled with granulations and little drops; it extends in a straight line to the anus. The rectum is colourless.

The nervous system is unknown in all the *Gastrotricha* hitherto investigated. In *Hemidasys agaso* this system seems also wanting, unless we may regard as of nervous nature four pairs of homogeneous and colourless globules lodged in the thickness of the parenchyma. Such an interpretation, however, would be very hypothetical. We might urge in its favour the fact that the first pair of these organs is in relation with a pair of little vibratile pits of the surface. These little organs remind us involuntarily of the vibratile pits of *Nemertes* and of many other *Turbellaria*, as well as of those of some *Annelides*—organs to which sensitive functions have often been ascribed. However, even in this case the functions of sensation are far from being demonstrated. The idea of an aquiferous or excretory system also naturally presented itself to my mind; but there was nothing to support this in my observations.

Hemidasys agaso is hermaphrodite. Originally I entertained a diametrically opposite opinion with regard to its sexual characters. In fact I had only found individuals with well-developed testes; but subsequently I found others loaded with their eggs, although otherwise formed like the first, and, in particular, furnished, like them, with a testis. If the individuals containing zoospermia but without eggs are frequent, on the other hand I have never met with individuals provided with eggs and destitute of zoospermia. This is how I explain this particular form of hermaphroditism:—Each individual only produces one egg, or rarely two at a time. After laying this egg, and before producing a new one, it loses temporarily all the characteristics of the female sex; nevertheless its male apparatus continues to possess zoospermia: hence an apparent predominance of the male sex.

The testis is an oval pouch, situated close to the intestine in the posterior part of the body. I have always found it filled with groups of zoospermia, fascicular bundles of the length of 0.044 millim.; their anterior third is undulated, the two other

